

PATENT APPLICATION  
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICATION OF  
KARL W. DIETRICH ET AL

SERIAL NUMBER: 09/077,914

FILED: JUNE 4, 1998

TITLE: PROCESS FOR PREPARING  
RIGID FOAMED MATERIALS  
CONTAINING URETHANE  
GROUPS



) GROUP NO.: 1711

) EXAMINER: M. FOELAK

Handwritten notes and stamps: "Af", "Gp1711", "#11/appeal", "12/9/99", "RECEIVED", "NOV 23 1999", "JTC 1700 MAIL ROOM".

**APPEAL BRIEF**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

This Brief, submitted in triplicate, is an appeal from the Final Action of the Examiner dated June 22, 1999 in which the rejections of Claims 11-15 and 18-23 (all of the pending claims) were maintained.

**I. REAL PARTY IN INTEREST**

This application has been assigned to Bayer Aktiengesellschaft, a German corporation, by each of the inventors. The real party in interest in this Appeal is therefore Bayer Aktiengesellschaft.

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Patents, Washington, D.C. 20231 11/19/99  
Date

Lyndanne M. Whalen - Reg. No. 29,457

Name of applicant, assignee or Registered Representative

A handwritten signature in cursive script, appearing to read "Lyndanne M. Whalen".

Signature

November 19, 1999

Date

## II. RELATED APPEALS AND INTERFERENCES

There are no pending appeals or interferences of which Appellants are aware that would be affected by or have a bearing on the Board's decision in this Appeal.

## III. STATUS OF CLAIMS

Claims 11-15 and 18-23 remain pending and are the subject of this Appeal.

Claims 1-10 were cancelled in the Preliminary Amendment filed June 4, 1998.

Claims 16 and 17 were cancelled in the Amendment filed May 14, 1999.

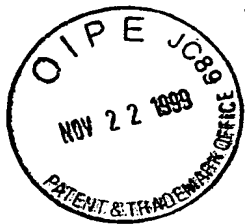
## IV. STATUS OF AMENDMENTS

No amendment to the claims has been made or requested subsequent to the Final Action dated June 22, 1999.

## V. SUMMARY OF THE INVENTION

The present invention relates to a process for the production of rigid polyurethane foams, to rigid polyurethane foams produced by this process and to the blowing agent composition used to produce these rigid polyurethane foams. In the process of the present invention, a polyisocyanate is reacted with an aromatic amine-initiated polyol in the presence of a blowing agent composition that includes from 5 to 50 parts by weight of a C<sub>3</sub> and/or C<sub>4</sub> alkane and from 50 to 95 parts by weight cyclopentane. The rigid polyurethane foams produced in accordance with the process of the present invention using the blowing agent compositions of the present invention retain their good thermal conductivity characteristics at temperatures as low as -30°C. (See specification at page 1, lines 21-25.) These foams have thermal conductivities comparable to foams made with only cyclopentane as the blowing agent and have improved compressive strength. (See the Table at page 7 of the specification.)

## VI. ISSUES



- A. Claims 11-15, 18 and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over De Vos et al (U.S. Patent 5,444,101).
- B. Claims 19-23 stand rejected under 35 U.S.C. § 102 as being substantially met by De Vos et al (U.S. Patent 5,444,101).

## VII. GROUPING OF CLAIMS

- A. None of the claims rejected under 35 U.S.C. § 103(a) (i.e., Claims 11-15, 18 and 21) will be argued separately in the response to this rejection.
- B. None of the claims rejected under 35 U.S.C. § 102 (i.e., Claims 19-23) will be argued separately in response to this rejection.

## VIII. ARGUMENTS

- A. One skilled in the art would not be led to Appellants' invention by the teachings of De Vos et al.

De Vos et al discloses a process for making rigid polyurethane foams using cyclopentane in combination with another co-blowing agent that satisfies a given equation. The foams produced by this process are said to have improved dimensional stability and thermal insulation properties.

Both De Vos et al and Appellants' claimed invention require use of cyclopentane. However, Appellants' claimed invention requires a C<sub>3</sub> and/or C<sub>4</sub> alkane co-blowing agent whereas De Vos et al teaches that the preferred co-blowing agents for the reference process are alkanes, cycloalkanes, hydrofluorocarbons, hydrochlorofluorocarbons, fluorocarbons, fluorinated ethers, alkenes, alkynes and noble gases with alkanes and hydrofluorocarbons being especially preferred. Sixty-eight specific compounds are disclosed by De Vos et al as "suitable" co-blowing

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agents. Isopentane, n-pentane and HFC-134a are specifically taught to be preferred co-blowing agents.

Isopentane, n-pentane and HFC-134a are clearly not a C<sub>3</sub> or C<sub>4</sub> alkane. Of the sixty-eight specific co-blowing agents taught by De Vos et al, only six are a C<sub>3</sub> or C<sub>4</sub> alkane. Not one of those six C<sub>3</sub> or C<sub>4</sub> alkanes is used in an example or otherwise identified as being more advantageous than any of the other sixty-two named co-blowing agents.

Appellants have found and the Examples given in the specification demonstrate that use of a blowing agent composition made up of from about 5 to about 50 parts by weight of cyclopentane and from about 50 to about 95 parts by weight of a C<sub>3</sub> and/or C<sub>4</sub> alkane in combination with an aromatic amine-initiated polyol produces foams having both good thermal conductivity and compression strength properties.

One skilled in the art reading the De Vos et al disclosure could not possibly have expected that this combination of properties could be achieved or that there would be any other advantage to using a C<sub>3</sub> or C<sub>4</sub> alkane co-blowing agent. De Vos et al does not even mention compression strength. The skilled artisan would not therefore be led by the teachings of the De Vos et al reference to select a C<sub>3</sub> or C<sub>4</sub> alkane co-blowing agent from the other reference co-blowing agents.

Selective picking and choosing without guidance from the art does not provide a proper basis for a rejection under 35 U.S.C. § 103.

In order to arrive at "Appellants' claimed invention, one skilled in the art must selectively choose a C<sub>3</sub> and/or C<sub>4</sub> alkane from the hundreds of possible co-blowing agents within the scope of the De Vos et al reference. The co-blowing agents selected can not, however, be the co-blowing agents taught to be most preferred by the reference. Nor can the co-blowing agent be selected from a co-blowing agent exemplified by the reference. The co-blowing agents selected could include some (specifically 6) of Appellants' required co-blowing agents if the "appropriate" selections were made from the 68 specific co-blowing agents named in the reference.

Appellants submit that the teachings of De Vos et al do not provide the guidance necessary for one skilled in the art who has not read their specification to make the "appropriate" selections.

Appellants would further note that one skilled in the art would be discouraged from selecting a C<sub>3</sub> and/or C<sub>4</sub> co-blowing agent because C<sub>3</sub> and/or C<sub>4</sub> alkanes are known to adversely affect blowing agent solubility in most of the polyols that are typically used to produce rigid polyurethane foams. (See discussion at page 2, lines 1-6 of the specification.) Solubility of a blowing agent in the foam-forming system is of concern because decreased solubility has a significant adverse effect upon the processability of the foam-forming mixture and upon the consistency of the product foam structure.

De Vos et al does not address this solubility issue. Nor could a solution to this problem be inherently disclosed in the DeVos et al '101 reference because no C<sub>3</sub> or C<sub>4</sub> alkane was used in any of the Examples given therein. One skilled in the art reading the DeVos et al '101 reference would not therefore consider it obvious to select the less soluble C<sub>3</sub> and C<sub>4</sub> alkanes from the many other more soluble co-blowing agents disclosed in the reference.

The teachings of De Vos et al would not therefore lead one skilled in the art to the co-blowing agents required in the present invention. De Vos et al does not therefore render Appellants' claimed invention obvious.

- B. De Vos et al does not disclose the blowing agent compositions of Claims 19-23 with the specificity necessary to support a rejection under 35 U.S.C. § 102.

As has already been discussed, De Vos et al does not specifically disclose or exemplify a single blowing agent composition in which cyclopentane and a C<sub>3</sub> and/or C<sub>4</sub> alkane are present in any amount much less an amount within the range required by Appellants' claims. One skilled in the art would therefore need to select from the large number of co-blowing agents disclosed by De Vos et al in order to "arrive at" some of the co-blowing agents useful in Appellants' claimed invention.

However, for a rejection under 35 U.S.C. §102, a reference must clearly and unequivocally disclose the claimed invention or direct those skilled in the art to the invention without any need for picking and choosing. In re Arkley, 172 USPQ 524 (CCPA 1972).

De Vos et al does not disclose clearly and unequivocally disclose Appellants' blowing agent compositions.

De Vos et al does not therefore anticipate Appellants' invention as claimed in Claims 19-23.

Specific reference to Claim 4 of the DeVos et al reference as support for this rejection was made during the prosecution of this case.

Appellants would, however, direct the Board's attention to the fact that Claim 4 of the De Vos et al reference requires a mixture of cyclopentane and **isopentane** satisfying the specified molar ratios. Isopentane, the co-blowing agent, is a C<sub>5</sub> alkane. Appellants' blowing agent mixture requires a C<sub>3</sub> and/or C<sub>4</sub> alkane co-blowing agent. The blowing agent mixture of DeVos et al's Claim 4 does **not** include a C<sub>3</sub> or a C<sub>4</sub> alkane blowing agent.

Claim 4 of the De Vos et al reference does not therefore disclose a blowing agent composition within the scope of Appellants' invention.

#### IX. CONCLUSION

Appellants have found that use of a blowing agent composition made up of from 5 to 50 parts of a C<sub>3</sub> and/or C<sub>4</sub> alkane and from about 50 to about 95 parts of cyclopentane produces a polyurethane foam having both the good thermal conductivity values of foams made with cyclopentane alone and improved compression strength characteristics at temperatures as low as -30°C.

De Vos et al discloses a process for making polyurethane foams in which cyclopentane and a co-blowing agent selected from hundreds of compounds are used. De Vos et al **does not** limit its co-blowing agents to alkanes. De Vos et al does not include a C<sub>3</sub> or a C<sub>4</sub> alkane in the list of most preferred co-blowing agents nor does De Vos et al exemplify a C<sub>3</sub> or a C<sub>4</sub> alkane co-blowing agent. De Vos et al does not teach that C<sub>3</sub> and/or C<sub>4</sub> alkanes are preferred for any reason. Nor does

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De Vos et al teach or suggest that the known solubility problems typically encountered with C<sub>3</sub> and C<sub>4</sub> alkanes would be avoided in the disclosed foam-forming systems.

One skilled in the art reading the De Vos et al disclosure would not therefore be guided by the reference teachings to select a C<sub>3</sub> and/or C<sub>4</sub> alkane co-blowing agent. The teachings of De Vos et al do not therefore render Appellants' invention obvious.

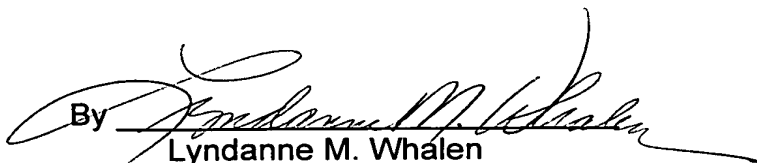
Appellants' claimed blowing agent compositions must include a C<sub>3</sub> and/or a C<sub>4</sub> alkane. De Vos et al does not disclose a single blowing agent composition in which a C<sub>3</sub> or a C<sub>4</sub> co-blowing agent is used. Nor does De Vos et al include any teaching which would lead one skilled in the art to select a C<sub>3</sub> or a C<sub>4</sub> alkane co-blowing agent from the hundreds of co-blowing agents within the scope of the reference disclosure.

De Vos et al does not therefore disclose Appellants' blowing agent composition with the specificity necessary to support a rejection under 35 U.S.C. § 102.

Appellants therefore maintain that each of the Examiner's rejections is in error and respectfully request that each of these rejections be reversed and that Claims 11-15 and 18-23 be allowed.

Respectfully submitted,

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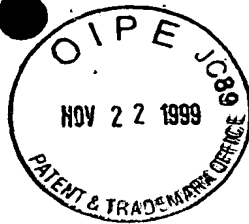
### CLAIMS ON APPEAL

11. A process for the production of a rigid polyurethane foamed plastic comprising reacting
- a) from about 5 to about 80 parts by weight of an aromatic amine initiated polyol,
  - b) a polyisocyanate,
  - c) a blowing agent comprising
    - 1) from about 5 to about 50 parts by weight of a C<sub>3</sub> and/or C<sub>4</sub> alkane
- and
- 2) from about 50 to about 95 parts by weight of cyclopentane, and
- optionally
- d) auxiliary additives.
12. The process of Claim 11 in which c) 1) is n-butane.
13. The process of Claim 11 in which c) 1) is isobutane.
14. The process of Claim 11 in which c) further includes from about 0.5 to about 4 parts by weight of water.
15. The process of Claim 11 in which c) further includes from about 1.5 to about 3 parts by weight of water.
18. The process of Claim 11 in which a) includes from about 20 to about 65 parts by weight of an aromatic amine initiated polyol.
19. A blowing agent composition comprising
- a) from about 5 to about 50 parts by weight of a C<sub>3</sub> and/or C<sub>4</sub> alkane and
  - b) from about 50 to about 95 parts by weight of cyclopentane.
20. The blowing agent composition of Claim 19 in which a) is n-butane and/or isobutane.
21. A rigid polyurethane foam plastic produced by the process of Claim 11.
22. The blowing agent composition of Claim 19 in which from 10 to 20 parts by weight of n-butane are present.



23. The blowing agent composition of Claim 19 in which about 15 parts by weight of isobutane are present.





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FILED: JUNE 4, 1998 )  
TITLE: PROCESS FOR PREPARING )  
RIGID FOAMED MATERIALS )  
CONTAINING URETHANE )  
GROUPS )

**LETTER**

Assistant Commissioner for Patents  
Washington, D.C. 20231  
Sir:

Enclosed herewith are three copies of an Appeal Brief in the matter of the subject Appeal. Please charge the fee for filing the Brief, \$300.00, to our Deposit Account Number 13-3848.

Respectfully submitted

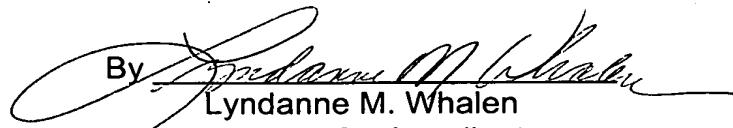
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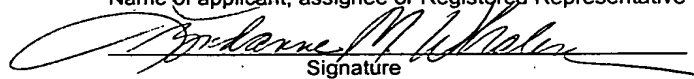
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Date

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Name of applicant, assignee or Registered Representative

  
Signature  
November 19, 1999  
Date